

# Surgical Management of Ptosis: A Review of 37 Cases

Manzoor Hussain, Jehangir Durrani

Department of Ophthalmology, Shaikh Zayed Postgraduate Medical Institute, Lahore.

## SUMMARY

*We reviewed 37 patients with ptosis managed during the years 1986 to 1993 at Shaikh Zayed Hospital, Lahore. Congenital ptosis, the most common lid anomaly, was present in 36 patients (97.21%) and acquired ptosis in only 1 patient (2.79%). Males were 20 (54%) and females 17 (46%). Unilateral ptosis was present in 35 patients (94.60%) and bilateral in 2 patients (5.40%). 2 patients (5.40%) with mild ptosis and good levator function were treated with Fasanella Servat procedure, 32 patients (86.48%) with moderate ptosis were managed by transconjunctival isolation and transcutaneous resection of the levator palpebrae superioris muscle. The amount of levator resection was determined by the formula proposed by Urist & Putterman. 3 patients (8.11%) with severe ptosis and poor levator function underwent Fascia Lata sling operation.*

*Key words: Fascia Lata, Fasanella Servat, Congenital Ptosis, Acquired Ptosis, Levator resection.*

## INTRODUCTION

**P**tosius is a condition in which there is diminution of the palpebral fissure in all its dimensions. It is the most common lid anomaly seen by ophthalmologists. Ptosis may be classified into two types; Congenital and Acquired<sup>1</sup>. Unlike most other lid affections most of the ptosis cases are congenital in origin.

Operative procedures available for correction of ptosis are: Fasanella Servat operation, Levator resection and Frontalis suspension. The ideal approach for ptosis surgery is one that achieves a satisfactory functional result and a reasonable improvement in the appearance of the operated eyelid, i.e., a "good match" with the normal lid and, when both lids are done at the same time, a "good match" with each other. For good cosmesis the upper eye lid creases and folds must be symmetric. The lid creases must be the same height above the upper lid margins. There should be a symmetry of the lids in position and contour of the margins, position and length of the lid fold and width of the palpebral fissure. There should be complete uncovering of both pupils and normal wink without lagophthalmos; all this without notching of the lid margins, distortion

or absence of lashes and exposure keratopathy. As the results of levator resection are very unpredictable, ptosis surgery should be done in a way that it may be easily modified if the surgery results in an undercorrection or an overcorrection.

This retrospective study was carried out to evaluate the results of surgical management of ptosis at Shaikh Zayed Hospital, Lahore.

## PATIENTS AND METHODS

We reviewed 37 cases of ptosis managed between October 1986 and July 1993 at Shaikh Zayed Postgraduate Medical Institute, Lahore, Pakistan. Visual acuity was checked to rule out amblyopia. Snellen's visual acuity chart was used for this purpose. Extraocular muscle movements were checked in all cases especially paying attention to superior rectus muscle. Bell's phenomenon and jaw-winking phenomenon were checked for. Routine slit lamp biomicroscopy and funduscopy were carried out. Pre-operative refractive status of the patients was assessed. General physical and systemic examinations were carried out. Routine blood and urine examinations were also done.

Ptosis was measured by marginal reflex

distance (MRD1) i.e the distance between the corneal reflection in the primary position to the centre of the upper eyelid margin, the normal being 4mm. Ptosis patients were divided into three groups:

- Mild 2mm
- Moderate 3mm
- Severe 4mm or more

Levator function was assessed by noting the total excursion of the centre of the upper lid margin in extreme down-gaze to extreme up gaze by means of a ruler held in front while pressing on the brow to negate any frontalis action. Levator function was graded as normal, good, fair, or poor:

- Normal 15mm
- Good 8mm or more
- Fair 5-7mm
- Poor 4mm or less

The amount of levator to be resected was determined by the formula proposed by Urist and Putterman: marginal limbal distance (MLD) i.e. the distance between the 6:00 corneal limbus and centre of upper lid in extreme upgaze was measured (frontalis muscle action was negated while measuring the MLD); the difference in MLD between the two sides multiplied by 3 determines the amount of levator to be resected. Amount of levator muscle resection was graded as minimal, moderate and maximal:

- Minimal 14-17mm
- Moderate 18-22mm
- Maximal 23mm

Patients with mild ptosis and good levator function were treated with Fasanella Servat operation, while patients with moderate ptosis and good to fair levator function underwent levator resection. Patients with severe ptosis and poor levator function were dealt with by fascia lata sling operation.

Ptosis surgery was done under general anaesthesia. Post operatively antibiotics were given orally for 5-7 days and polyfax eye ointment was applied locally. Skin sutures were removed on 6th post-operative day. The post-operative assessment follow up visits were at 1 month, three months and 6 months.

## RESULTS

A total of 37 cases with ptosis were dealt with. Congenital ptosis was present in 36 patients (97.21%) and acquired ptosis in only 1 patient (2.79%) (Table 1). There were 20 males (54%) and 17 females (46%) (Table 2). The condition was unilateral in 35 patients (94.60%) and bilateral in 2 patients (5.40%) (Table 3). Ptosis was mild (2mm) in 20 patients (54.05%), moderate (3mm) in 12 (32.43%),

**Table 1: Types of ptosis.**

Type	No of Cases	Percentage
Congenital	36	97.21
Acquired	1	2.79
<b>Total</b>	<b>37</b>	<b>100.00</b>

**Table 2: Sex distribution.**

Sex	No of Cases	Percentage
Male	20	54
Female	17	46
<b>Total</b>	<b>37</b>	<b>100</b>

**Table 3: Laterality.**

Laterality	No. of Cases	Percentage
Unilateral	35	94.60
Bilateral	2	5.40
<b>Total</b>	<b>37</b>	<b>100.00</b>

and severe (4mm or more) in 13 patients (35.14%) (Table 4). Levator function was good (8 mm or more) in 11 patients (29.72%), fair (5-7mm) in 20 patients (54.05%) and poor (4mm or less) in 6 patients (16.23%) (Table 5). Fasanella Servat procedure was done in 02 patients (5.40%), levator resection in 32 patients (86.48%) and sling operation in 3 patients

**Table 4: Amount of ptosis.**

<i>Amount of ptosis</i>	<i>No. of Cases</i>	<i>Percentage</i>
Mild (2 mm)	2	5.40
Moderate (3 mm)	22	59.46
Severe (4mm or more)	13	35.14
<b>Total</b>	<b>37</b>	<b>100.00</b>

**Table 5: Levator function.**

<i>Levator function</i>	<i>No. of Cases</i>	<i>Percentage</i>
Good (8 mm or more)	11	29.72
Fair (5-7 mm)	20	54.05
Poor (4mm or less)	6	16.23
<b>Total</b>	<b>37</b>	<b>100.00</b>

(8.11%) (Table 6). Amount of levator muscle resection carried out was minimal (14-17mm) in 14 cases (43.75%), moderate (18-22mm) in 13 cases (42.62%) and maximal (23mm) in 5 cases (15.63%) (Table 7). Levator muscle resection was done by the combined approach whereby the levator was dissected transconjunctivally and resected transcutaneously. Postoperative lid level was good (within 1 mm of normal) in 33 patients (89.19%) and fair (within 1.1-2mm of normal) in 4 patients (10.81%) (Table 8). One (2.70%) of our patients had overcorrection and 3 (8.10%) had undercorrection.

**Table 6: Treatment**

<i>Treatment Modality</i>	<i>No. of Cases</i>	<i>Percentage</i>
Fasanella servat	2	5.40
Sling operation	3	8.11
Levator resection	32	86.48
<b>Total</b>	<b>37</b>	<b>100.00</b>

Lid lag was present in 8 patients (21.62%). It disappeared completely in 4 of them over 6 months period and the remaining 4 had persistent mild

lagophthalmos. Exposure keratopathy developed in 3 patients (8.10%). These were treated with Tears naturale/Liquifilm tears during the day and Lacrilube eye ointment at bed time. Conjunctival prolapse was present in 1 patient (2.70%) that disappeared over a period of 2 weeks (Table 9).

**Table 7: Levator palpebrae superioris resection.**

<i>Amount</i>	<i>No. of Cases</i>	<i>Percentage</i>
Minimal (14-17mm)	14	43.75
Moderate (18-22mm)	13	42.62
Maximal (23mm)	5	15.63
<b>Total</b>	<b>32</b>	<b>100%</b>

**Table 8: Post operative lid level.**

<i>Lid Level</i>	<i>No. of Cases</i>	<i>Percentage</i>
Good (within 1mm of normal)	33	89.19
Fair (within 1.1-2mm of normal)	4	10.81
<b>Total</b>	<b>37</b>	<b>100.00</b>

**Table 9: Post operative complications.**

<i>Complication</i>	<i>No. of Cases</i>	<i>Percentage</i>
Overcorrection	1	2.70
Undercorrection	3	8.10
Lid Lag	8	21.62
Exposure Keratopathy	3	8.10
Conjunctival Prolapse	1	2.70

## DISCUSSION

Ptosis is not a life threatening condition but it leads to several ocular and psychological complications. There is a high incidence of amblyopia and anisometropia in ptosis patients. Amblyopia is usually associated with anisometropia



and/or strabismus. In patients who are predisposed to develop amblyopia because of an associated strabismus and/or anisometropia, the presence of ptotic lid contributes to the preference of the other eye for fixation. In the astigmatism that develops, greatest curvature is usually along the 90 degree meridian.

When bilateral ptosis is severe and frontalis muscle action is insufficient to elevate the lids, an abnormal head posture i.e an elevation of chin to clear the visual axis, is adopted. This may lead to structural changes in cervical muscles, ligaments & bones. Psychological effects upon a child with ptosis are important. There are the development of an inferiority complex and even withdrawal from contact with other children.

Ptosis surgery has two main objectives:

1. A satisfactory functional result. The sacrifice of protective and tear producing structure and function should be avoided whenever possible. The cornea must be protected, vision preserved, and complications maintained to a minimum.
2. A reasonable improvement in the cosmetic appearance of the operated lid i.e. a "good match" with the normal lid and, when both lids are done at the same time, "good match" with each other.

For good cosmesis the upper eyelid creases and folds must be symmetrical. The lid creases must be the same height above the upper lid margins. The skin below the crease must be smooth and firmly attached to the tarsus or, in cases with a short tarsus, adherent to the tarsus and levator muscle upto the crease, the skin above the crease must be loosely attached so that it forms symmetric folds over the crease.

The ideal should be to achieve complete uncovering of both pupils and normal winking without lagophthalmos; all this without notching of the lid margins, distortion or loss of lashes and exposure keratopathy.

Results of ptosis operations are characterized by unpredictability, hence the need for the individual assessment, by the amount of ptosis and levator function as determined preoperatively. So ptosis surgery should be done in a way that it may be modified in the event that the immediate result is not satisfactory.

Management of congenital ptosis is exclusively surgical. Timing of surgery is controversial. It is well advised to postpone the operation until 4-5 years of age as the assessment of levator action is then more accurate. But if ptosis is severe and there is concern regarding development of amblyopia from occlusion of the visual axis, or of structural changes in the cervical muscles, ligaments and bones from abnormal head posture, an operation should be performed at about 2 years of age or as soon as the child is able to stand and walk<sup>5</sup>.

Our experience with the 37 cases of ptosis managed during the last six years is limited but shows some distinct features compared to the data presented from the Western countries. The incidence of unilateral ptosis in our study was 94.60% while the incidence reported in the literature is below 61% (Spaeth)<sup>6</sup> and 75% (Beard)<sup>3</sup>. Male to female ratio in the present study is 1.2:1 which means a male preponderance, compared to equal sex distribution quoted in the literature<sup>7</sup>. None of our patients had any other ocular or systemic anomaly, while 50% of congenital blepharoptosis cases needed surgery for the associated ocular problems in Spaeth's series<sup>8</sup>.

In the present study absence of other ocular anomalies associated with congenital ptosis may be related to small sample size. Three of our patients (8.11%) had astigmatism ranging from 0.50 DC to 1.75 DC with the rule on the ptotic side. This incidence is low<sup>8</sup>. None of our patients was amblyopic compared to other studies 55% and 25%<sup>9</sup>. This may be related to the fact that in our patients ptosis was not severe enough to occlude the visual axis, no fusion disability from an oculomotor deviation, and anisometropia were present. The incidence of Marcus-Gunn jaw winking phenomenon was zero in our study compared to 2-12% in the other series quoted above. The incidence of anisometropia in our study was 10% compared to 25% quoted in the literature<sup>9</sup>. The incidence of strabismus in our study was zero compared to 58% given in the literature<sup>9,10</sup>.

The controversy regarding internal or external approach for levator muscle resection in ptosis surgery is quite old. The transconjunctival route gives a speedy and safe dissection of the levator from the orbicularis, but subsequent suture placement through skin leaves the aponeurosis in proximity, but not anatomically attached to its new insertion, hence depending upon development of adhesions for

its new attachment. The lid crease is not very well created in most cases<sup>11</sup>.

The transcutaneous isolation and resection needs more experience at isolation of the muscle, but like surgical exposure anywhere else, gives the advantage of anteroposterior approach. The levator attachments are better identified and after resection the aponeurosis is actually sutured to its new insertion. The skin crease is also created by suturing the skin to the upper edge of the tarsal plate<sup>5</sup>.

Putterman and Urist reported the combined technique of transconjunctival isolation (TCI) and transcutaneous resection (TCR) of the levator palpebrae superioris muscle (12). They came to regard it as the procedure of choice after performing over 200 internal transconjunctival levator muscle resections, 100 external transcutaneous procedures and over 75 combined operations.

The criteria for success have also become more stringent. In 1969, Smith et al reviewed the surgical results for 148 patients and reported that a good result, considered to be correction within 1-2 mm for patients with 4 mm of ptosis, was achieved in 73% of cases. They also showed that success rates varied from 48 to 89% after reviewing published results<sup>13</sup>.

In 1979, Anderson and Dixon reported a success rate of 83% in acquired ptosis with 1 mm or less of residual ptosis as the criterion of success and a minimum 1 year of follow up. His study included 23 patients with congenial ptosis, 18 patients with acquired ptosis, and 19 patients with neurogenic ptosis<sup>14</sup>.

In 1983, Older reported a 95% success rate in 116 acquired ptosis and 58% in congenital ptosis cases using 1 mm or less of residual ptosis as the criterion for success; average follow up being 6-7 months. They identified post-operative lid droop 2 to 4 months after surgery and attributed it to disinsertion of the aponeurosis as the absorbable sutures of 6-0 double armed polyglactin weaken. Therefore, they recommended the use of nonabsorbable sutures<sup>15</sup>.

Anderson believes that besides the absorbable suture, the late failures can also be due to inadvertent aponeurosis tuck or suture placement in rarefied aponeurosis<sup>3</sup>.

Hylkema and Koorneef have also showed that the amount of levator resection cannot be predicted from preoperative assessment of the levator function and degree of ptosis<sup>7</sup>. They recommend adjustable suture surgery via the anterior approach. Although

patients were selected exclusively on the basis of the amount of ptosis (exceeding 2 mm) and levator function (exceeding 3 mm) 86% of patients were reported to have good cosmetic results after a single procedure. In case of congenital ptosis, 90% achieved cosmetically satisfactory post-operative lid level.

Berlin and Vestal reported that the major factor in determining results is the amount of ptosis preoperatively whereas levator function and type of anaesthesia have no effect<sup>15</sup>. This is contrary to accepted criteria by a majority of ptosis surgeons and we found preoperative levator muscle function has a definite relationship to the amount of muscle resected. For slight degree of ptosis of upto 2.5 mm, the Fasanella-Servat operation<sup>5</sup> is often satisfactory. The procedure is simple and highly predictable. Fresh autogenous fascia lata, for frontalis suspension, has proved to be the most suitable material because of its potentially permanent effect as transplanted living tissue<sup>5</sup>. Preserved fascia lata, used in children under 2 years of age, has increased risk of recurrence<sup>16</sup>.

Our results of ptosis surgery are comparable to many studies showing highest rates of success for levator resection as well as for Fasnella-Servat and frontalis suspension.

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**The Authors:**

Manzoor Hussain  
Senior Registrar,  
Department of Ophthalmology,  
Shaikh Zayed Postgraduate Medical Institute,  
**Lahore.**

Jehangir Durrani  
Professor,  
Department of Ophthalmology,  
Shaikh Zayed Postgraduate Medical Institute,  
**Lahore.**

**Address for Correspondance:**

Manzoor Hussain  
Senior Registrar,  
Department of Ophthalmology,  
Shaikh Zayed Postgraduate Medical Institute,  
**Lahore.**